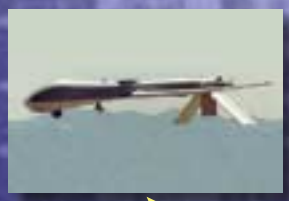
Tactical Control System

PROGRAM EXECUTIVE OFFICER–CRUISE MISSILES




Tactical Control System
TCS
JPO UAV

TASK FORCE COMMANDER
BATTLE GROUP
HMMWV
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TOC
SOF

NAVSEA
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Surface Warfare Center Division

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Overview

The tools for the United States military twenty-first century warfare are being developed now. It is apparent that warfare will be conducted differently in the future. With the need for zero casualties in personnel and equipment, the need for lower life-cycle costs, and the need for joint interoperability and connectivity in real time: command, control, communication, and data dissemination among the existing and future Unmanned Aerial Vehicles (UAVs) has become critical.

Under the leadership of the Program Executive Officer, Cruise Missiles and UAVs (PEOCU), the Tactical Control System (TCS) is an Office of Secretary of Defense (OSD) initiative to provide joint warfighting commanders with interoperable and scalable command, control, communications, and data dissemination systems for Medium Altitude Endurance (MAE) and tactical UAVs.

The TCS program uses a revolutionary acquisition process known as concurrent, incremental, spiral, systems engineering. Deliveries to the users are made as capabilities are developed. Key performance parameters, requirements, and priorities were approved by the JROC late in 1996. Early in 1997, the TCS Operational Requirements Document was approved, and in the fall of 1997, TCS was designated an Acquisition Category II Program.

Major drivers for TCS are to develop a system using DoD standards (hardware and software), the DoD common operating environment (DII/COE), and provide the capability to disseminate UAV information to the warfighters for intelligence reconnaissance, surveillance, and targeting. The TCS system architecture has now been expanded to include other unmanned vehicles for a broad range of littoral mission applications. NSWCDD, CSS demonstrated functionality of TCS for both unmanned maritime vehicles (UMV) and unmanned ground vehicles (UGV) in the spring and fall of 1998, respectively.

TCS is a joint solution for MAE and tactical UAVs among all U.S. military services and within NATO. The program is on schedule, and elements of the TCS program are in use by warfighters today. A government/industry team, operating in an integrated product structure, is developing the TCS program. NSWCDD is providing key personnel in this team.

NSWCDD Role in TCS

As a key member of the team participating in the development of TCS, NSWCDD has the following responsibilities:

- Acquisition and programmatic support of the Joint Project Office (JPO)
- Requirements and analysis for the software development process
- Navy system and software engineering
- TCS architecture development
- TCS software development, upgrades, and integration
- Navy system integration
- Planning and execution of test and demonstrations
- C4 interoperability planning and execution of tests and demonstrations
- Technical support to USACOM

TCS in Action

The TCS program has developed three fieldable prototypes using production quality hardware and software which have been used in several different warfighting exercises. TCS development efforts have proven the overall TCS concept and proven that an architecture and system can be developed which allows for interoperability and scaleability. In addition, TCS has established an international product. Two FMS cases and 1 international agreement are in place within the TCS program. Recent development and deployments include:

- *Interoperability*
  - TCS has now conducted over 350 hours of flight time with 8 different types of air vehicles. In addition, TCS has been proven to be interoperable with 8 different types of Command and Control and Weapon Systems. TCS has conducted Level 4, command and control of the air vehicle and payload with 4 different types of air vehicles--2 MAE and 2 TUAV. TCS software is being developed using the DOD standard DII common operating environment. TCS will evolve to a level 8 compliance.
- *Scaleability*
  - *Software* --TCS is now working in different services computer systems, Sun and Hewlett Packard. The exact same TCS core source is operating in both types of computers. *Hardware*--TCS has been installed in prototype HWMMV shelters and shipboard environments.
- *International*
  - *Architecture Validation*--A NATO International Industrialist Working Group was established in 1997 to investigate feasibility of international UAV interoperability. This NIAG group consisted of 37 corporations from 11 nations. The NAIG validated the TCS architecture as the approach to achieve UAV interoperability.
  - *International Technology Demonstration Program*--TCS is now working with Germany, Canada and the United Kingdom to conduct UAV interoperability demonstrations.

TCS with the Warfighters

The TCS systems have participated in multiple warfighting exercises:

- JWID 98
- FLEETEX 98
- JWID 97
- TASK FORCE XXI

Expected Benefits of TCS

- Interoperable--single system for all services
- Reception of imagery and data simultaneously from different types of UAVs at a single interoperable control system
- Full function and control of the UAV from takeoff to landing
- Logistics and training life cycle cost savings
- Reduction of manpower training for operations of UAV systems
- Use of COTS and GOTS in standard DoD architecture
- Common mission planning, mission execution and data dissemination
- Interaction from fixed and mobile land based units as well as from ships

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